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**D. A. MOREL MOREL**  
Belgorod National University, Russia

### COMPARING THE SAME STIMULUS ASSOCIATIVE FIELDS FIXED IN DIFFERENT HISTORICAL PERIODS (TECHNIQUE APPLICATION CASE STUDY)

The data of an associative experiment can be consolidated in the form of an associative dictionary which is a unique research tool [11: 5-7] helping to describe collective “ordinary” consciousness of native speakers, public “mental climate” [12: 5]. It should be noted in this regard that “the interest in the study of the dynamics of language consciousness on the material of comparative analysis of the associative fields differing in the time of fixation has grown nowadays” [1: 15].

Regarding such a comparison as a prominent source providing significant data on the naïve picture of the world dynamics we have been carrying out a research embracing materials of “Russkiy assotsiativnyy slovar” (“RAS”) and of the author experiment (reproducing “RAS” data acquisition procedure) (e.g. [3]). The work done allowed us to establish a specific technique of such a comparative research consisting of three steps presented below.

The present study observes the associative fields of the world-stimulus ‘bezopasnost’ (safety / security) fixed in two different periods: 1988-1997 ( $T_0$ ) and 2013-2014 ( $T_1$ ) to set an example and present step-by-step technique description.

#### *Step 1: analyzing and comparing general figures.*

This stage of data analysis implies general preprocessing and operating a few indicators as follow.

The number of reactions ( $\Sigma R$ ) comprises all respondents’ answers including refusals and corresponds to the total number of respondents involved in the experiment. The number of associates ( $\Sigma A$ ) is equal to the sum of all *dissimilar* answers regardless their frequency.

Since the number of respondents can vary at different stages of the experiment it is worth operating relative indices (normalized in frequency).

The frequency ratio ( $R_f = \Sigma R / \Sigma A$ ) along with the shares of single associates (in the total number of given associates) and their references (in the total number of reactions) explicit the degree of field’s standardization and respondents’ associative constriction, the extent and the weight of field’s extreme periphery.

The fraction of refusals can be also revealing since an abnormally big share of refusals (in the total number of reactions) manifests the presence of difficulties respondents meet with while trying to establish an associative link.

The growth rate ( $G$ ) is the ratio of indicator’s value at the final stage ( $T_1$ ) to the one at the initial stage ( $T_0$ ).

The values of the mentioned indicators of the field under study are tabulated in Table 1.

Table 1

#### General figures

Indicators	$T_0$	$T_1$	$G$
number of associates	51	52	
number of reactions	105	100	
frequency ratio	2,059	1,923	0,934
share of single associates, %	82,35	75,00	0,911
share of single associate references, %	40	39	0,975
share of refusals, %	2,86	1	

As we can see this step results shows no distinct divergence in diachrony: at both stages the average frequency of associates is neither high nor low, the amount of single associates is rather large—thence the extreme periphery of the field is widely extended—but their weight is fairly modest.

Here we face a rather uncommon situation: the general frequency reduction along with the decrease of single associate representativity. The very fact reveals some inner dynamics of the structure of the field under study. It can be treated as kernel weight decreasing accompanied with *far* (not extreme) periphery weight increasing but requires a more thorough examination (see below).

This step can also bring some information on features of demographic groups’ (age, gender,

ignifysional—see on-line “RAS” interface [10]) associative fields. Here we confine ourselves to a gender group comparison (see Table 2).

Table 2

Gender groups general figures

Indicators	Male respondents			Female respondents		
	T <sub>0</sub>	T <sub>1</sub>	G	T <sub>0</sub>	T <sub>1</sub>	G
number of associates	28	33		27	29	
number of reactions	53	50		52	50	
frequency ratio	1,893	1,515	0,800	1,926	1,724	0,895
share of single associates, %	78,57	75,76	0,964	85,19	72,41	0,850
share of single associate references, %	41,51	50	1,205	44,23	42	0,950
share of refusals, %	3,77	0		1,92	2	

As we can see the contradictory situation with growth rates as above is fully conditioned by female respondents’ answers whereas male ones show a rather common picture with the reduction of the average frequency and the growth of single associate weight.

Male respondents’ associative field features more distinct individuality (wider representativity of single associates hence extension of the extreme periphery and less average frequency of associates) than female ones at the final stage. Such a state of affairs is, properly speaking, fairly common for contemporary respondents of different age groups (e.g. [5]) but as for T<sub>0</sub> this tendency is not valid.

Another important aspect here is a general overview of gender-specific / gender-mutual parts of the associative field under study (see Table 3).

Table 3

Gender specific / mutuality

			share of associates	share of reactions	share of single associate references
gender-mutual part	all answers	T <sub>0</sub>	7.84%	49.52%	—
		T <sub>1</sub>	19.23%	51%	—
		G	2.452	1.030	—
gender-specific part	male respondents’ answers	T <sub>0</sub>	85.71%	51.0%	39.69%
		T <sub>1</sub>	69.7%	48%	44%
		G	0.813	0.941	1.109
	female respondents’ answers	T <sub>0</sub>	85.19%	49.94%	40.32%
		T <sub>1</sub>	65.52%	50%	34%
		G	0.769	1.001	0.843

According to the presented data the gender-mutual part of the field under study has grown due to the extension of the range of low-frequency associates. The male-specific part has shrunk both in size (share of associates) and weight (share of reactions). The female-specific part has shown a tendency to consolidation shrinking in the range of associates and keeping their aggregate frequency.

As for the weight of single associates it has been steadily declining in females respondents’ answers—proving the mentioned tendency—and slightly growing in male ones.

**Step 2: analyzing and comparing top associates.**

Top associates (or “predictable associations”—see [2: 287]) provide valuable raw data on the existing stereotype reactions (e.g. [11: 757; 1: 14]) as well as on the most salient features of a prototypical representative of the concept under study [8; 3].

The field under study displays very distinct picture of top associates distribution and dynamics (see Table 4, where top values for each stage and respondents’ subgroup are in bold).

Top associates (percentage in reactions)

Associates	all answers		male respondents' answers		female respondents' answers	
	T <sub>0</sub>	T <sub>1</sub>	T <sub>0</sub>	T <sub>1</sub>	T <sub>0</sub>	T <sub>1</sub>
‘dvizheniya’ (of road traffic)	<b>40,95</b>	0	<b>37,74</b>	0	<b>44,23</b>	0
‘spokoistvie’ (serenity)	1,9	6	0	0	3,85	<b>12</b>
‘dom’ (home / house)	0	<b>10</b>	0	<b>14</b>	0	6
‘okhrana’ (guard / protection)	0,95	<b>7</b>	1,89	6	0	8
‘zashchishchennost’ (proofness / security)	0	6	0	2	0	<b>10</b>
‘dvizhenie’ (traffic)	3,81	0	5,66	0	1,92	0
‘garantiruetsya’ (is guaranteed)	2,86	0	0	0	5,77	0
‘zaschita’ (defense / protection)	0	6	0	6	0	6
‘nadyozhnost’ (reliability)	0	6	0	6	0	6
‘OBZh’ (Fundamentals of Health and Safety)	0	6	0	6	0	6

At the initial stage the major part of respondents of both sexes steadily associates safety / security with the road traffic. At the final stage respondents are not so unanimous linking the stimulus with home / house, protection, serenity, proofness, Fundamentals of Health and Safety, the single gender difference being frequency values. Thus,  $T_1$ -respondents stably associate ‘bezopasnost’ with means of its maintenance and states caused by or causing it. The female respondents are more concerned with states (serenity and proofness) whereas male ones—with an artifact causing the feeling of safety [7].

$T_0$ -state field features very abrupt, exponential-like profile of the frequencies distribution graph. It has a kernel reduced to a single dominant associate, no prekernel area and hardly any close periphery representatives. Both male and female respondents' fields have the similar distribution.

Changes at the final stage are drastic. The  $T_0$ -dominant has completely fallen into oblivion whereas all  $T_1$ -top associates are irrelevant for  $T_0$ -respondents.  $T_1$ -state field has a smoothed, sloping profile of the frequencies distribution graph, only the male respondents' field distinguishes by a certain gap between the top associate forming the kernel and the close periphery.

### *Step 3: analyzing and comparing semantic clusters.*

Depending on the models of concept representation groups of associates resulting from the procedure of semantic clusterization of respondents' answers can correspond to cognitive characters / layers / segment of the field model [9: 60-62], to nodes of a semantic network [4], to slots of a frame [6].

At this stage of study both vertical (common-size) and horizontal (trend) analyses should be applied. With regard to our research specifics a vertical analysis implies comparing each cluster shares in total numbers of associates and reactions (see [8]) then followed with revealing changes in these distributions over time. A horizontal one allows to reveal growth rates of clusters.

For each cluster we calculate its total frequency ( $F$ )—total percentage of its reactions—and its degree of representation in the field ( $Rp$ )—total percentage of its associates. We can also apply to the ranking of clusters for their vertical analysis [Ibidem] at this stage of study.

The associative field under study can be split up into twenty clusters as follow:

*safety / security...* 1) of road traffic; 2) is ensured; 3) is not ensured; 4) of life; 5) public; 6) personal; 7) is a needed value; 8) is an action or its subject; 9) is people or organizations dedicated to its ensuring; 10) is an artifact dedicated to its ensuring; 11) is a building dedicated to its ensuring; 12) is a home; 13) is a state, condition; 14) is a characteristic; 15) is the accident prevention; 16) is a school subject; 17) vs. danger; 18) perfect; 19) inconspicuous; 20) information.

The distributions of each cluster's shares in reactions ( $F$ ) and associates ( $Rp$ )— along with the growth rates of these shares—of the whole associative field are given in Fig. 1, the same indicators of the male respondents' field—in Fig. 2, and of female ones—in Fig. 3.

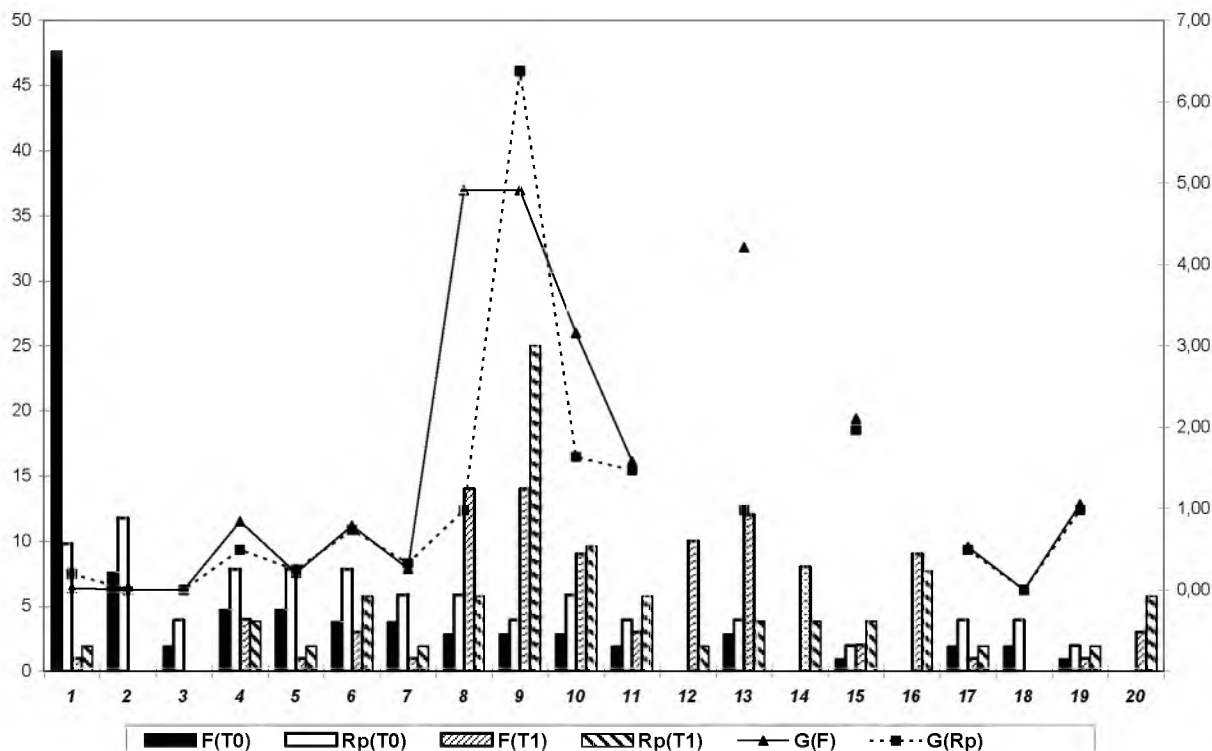


Fig. 1. General clusters distributions and growths

In all figures the left y-axis corresponds to the percentage of clusters (in reactions—odd columns, in associates—even ones), the right one—to the growth ratios. Growth ratios graphs can have breaks due to an arithmetical reason: when a cluster has a null representativity at the initial stage its growth rate cannot be calculated (division by zero error).

At the level of the whole field we can see 3 clusters (No. 2, 3, 18) have fallen into oblivion and 4 clusters (No. 12, 14, 16, 20) have emerged. Extinct clusters refer to the degree of safeguarding and contain all verbal associates. 4 top clusters showing the highest growth rates (No. 8-10 along with an emerged mono-cluster “home / house”) are related to different means ensuring security (people, artifacts, procedures).

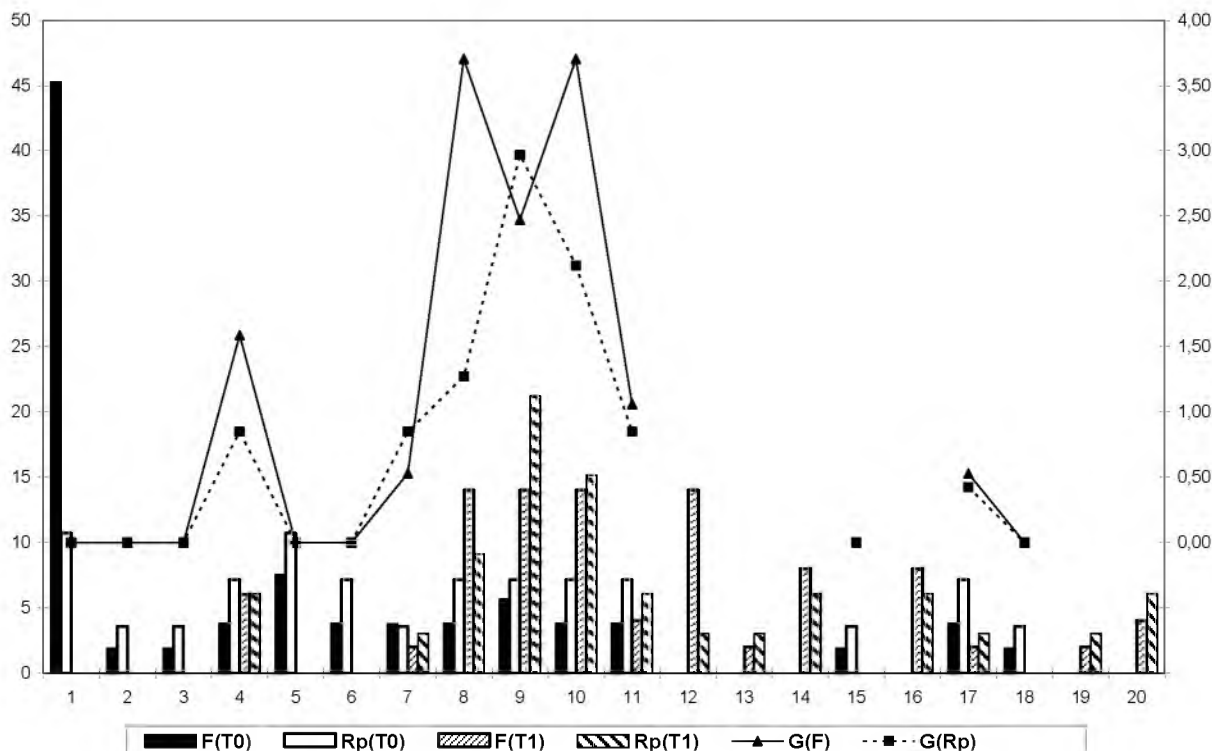


Fig. 2. Male respondents' field clusters distributions and growths

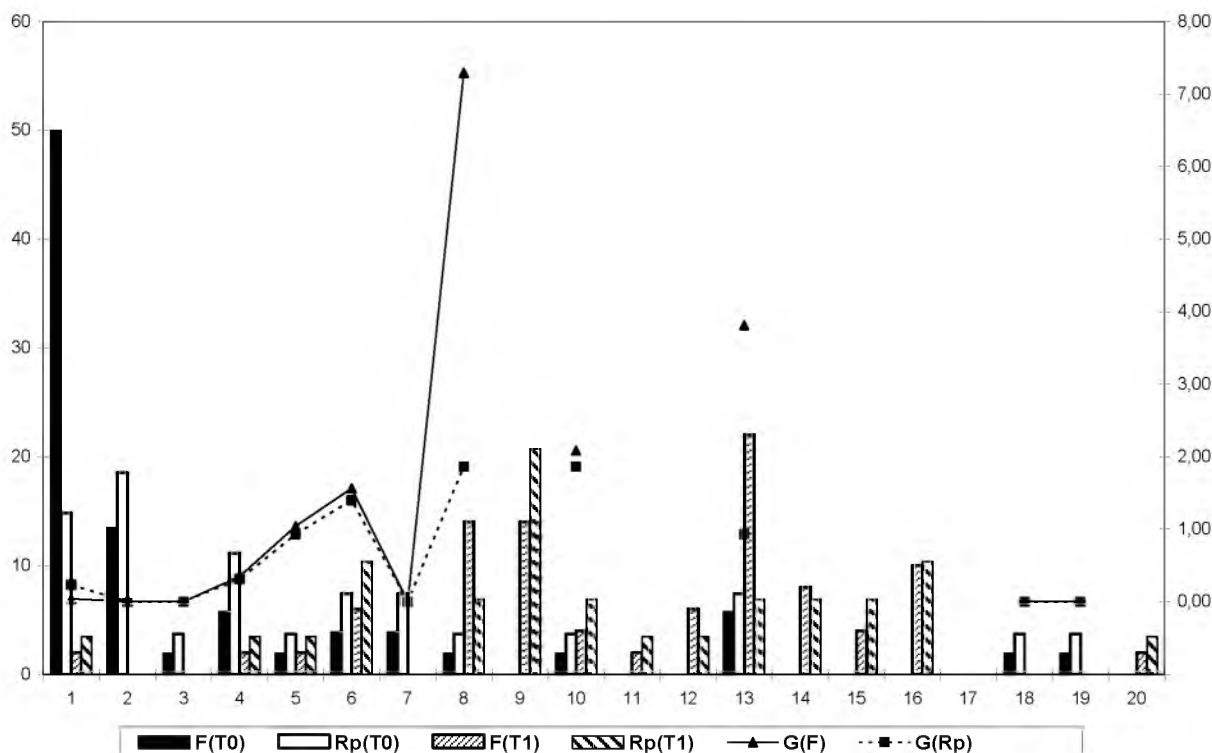


Fig. 3. Female respondents' field clusters distributions and growths

The dynamics of gender fields shows no crucial differences from the general one. Both male and female respondents are unanimous in expelling from their linguistic consciousness associative links with road traffic, values, degree of safeguarding. The cluster “people or organizations dedicated to ensure security” demonstrates a dramatic expansion. The rapidity of its growth is accentuated by the fact that its representativity is considerably greater—and increases faster—than its total frequency.

Male respondents' field has regressed to some extent: 7 clusters have been extinct (No. 1-3, 5-6, 15, 18) and only 6 have emerged (No. 12-14, 16, 19-20). On the contrary, female respondents' field shows some structural progress with 7 emerged (No. 9, 11-12, 14-16, 20) and 5 extinct (No. 2-3, 7, 18-19) clusters.

The emergence of clusters “information security” and “fundamentals of health and safety as a school subject” is fairly consonant with the spirit of the times.

The undertaken research allows us to make some general observations on the proposed technique.

1. This technique is easy-to-use, being neither sophisticated nor requiring somewhat complex mathematical apparatus. It can be easily adjusted to the needs of a specific study. We do not have to fulfil the whole sequence step by step if the particular purposes do not demand it. Moreover, at each stage we can confine ourselves to an undifferentiated examination of a field as a whole, or we can go into details of different demographic groups' pictures of the world.

2. The usage of quantitative methods must not supplant the application of purely linguistic ones. Thus, for example, different forms of semantic analysis are of crucial importance at two last stages of study.

3. Whilst carrying out vertical field analysis we should not confine ourselves considering associates / reactions proportions of clusters *apart*; we need also to draw a comparison *between* these indicators.

4. Not only total figures but also the inner organization of clusters should be examined. We do not apply to comparing average frequencies of clusters (cf. [8]) for the following reason. Clusters (as well as associative fields in whole) can considerably vary in their profiles of the frequencies distribution. A cluster may consist of a single dominant or a compact flat group of high-frequency associates along with a number of low-frequency ones, of low-frequency associates only, it may also have a smoothed, sloping profile without marked gaps in the kernel → periphery distribution. The mentioned averaging totally levels this important picture of the inner field structure reducing the explanatory value of findings.

Some findings concerning the associative field under study should also be mentioned.

1. Taking into consideration the dynamics of single associates representativity as well as the data from Table 2 we can instantiate an early observation [5]: at the present stage ( $T_1$ ) associative fields based upon male respondents' answers feature greater individuality of established associative links (larger amount of single and low-frequency associates thence lower frequency ratio) whereas fields produced by female respondents are more dense featuring greater reproducibility and standardization of answers (as well as less amount and weight of single associates).

2. The sets of top associates as well as the profiles of frequency distribution within the fields have changed drastically over time showing blurring of the stereotype. Besides the complete replacement of the "stereotype vector of associating" (see [1: 14])—thence of the prototypic representatives of the safety / security—we see respondents' unanimity slumping.

Nowadays, "bezopasnost" is associated mainly with means (artifacts, people, procedures) of its maintenance and states caused by or causing it, but not with road traffic.

1. Comparative analysis of clusters reveals deep transformations in the structure of the field under study. We are witnessing the decline (up to full extinction) of clusters representing the degree and the actions of safeguarding, the value nature of "bezopasnost", opposing it to the danger, reducing it to the traffic safety. At the same time the clusters representing subjects and artifacts assuring safety, defining "bezopasnost" as a state or characteristic demonstrate a stable expansion.

Elicited facts send a firm signal that contemporary respondents try to dissociate themselves from the maintenance of safety, to forget about the danger, to shut themselves off it behind guards' backs, walls, and other security facilities. The extinction of verbal reactions in  $T_1$ -respondents' answers bolster up this conclusion. The revealed processes are not gender specific and reflect shifts in the naïve picture of the world.

Gender peculiarities come to two main points: female respondents are focused on the interpretation of "bezopasnost" as a *state*, whereas male ones identify it mostly with an *artifact*.

2. All of the aforesaid leads to the conclusion that the attitude to safety / security has undergone radical changes within the speech community over time thence the transformation of the deep conception of safety / security in the linguistic consciousness.

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